DOCUMENT RESUME

ED 435 481 PS 028 067

AUTHOR Specht, Jacqueline; Wood, Eileen; Willoughby, Teena
TITLE Computer Training for Early Childhood Educators.
SPONS AGENCY Social Sciences and Humanities Research Council of Canada, Ottawa (Ontario).
PUB DATE 1999-04-00
NOTE 17p.; Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, Quebec, Canada, April 19-23, 1999).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150) -- Tests/Questionnaires (160)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Computer Anxiety; *Computer Attitudes; *Computer Literacy; *Computer Uses in Education; Early Childhood Education; *Educational Technology; Foreign Countries; *Information Needs; Information Sources; Knowledge Base for Teaching; Needs Assessment; *Preschool Teachers
IDENTIFIERS Canada

ABSTRACT

Recent research in early childhood education (ECE) centers suggests that some teacher characteristics are not at a level that would support computer learning opportunities for children. This study identified areas of support required by teachers to provide a smooth introduction of the computer into the early childhood education classroom. Participating were 192 female and 4 male early childhood educators from 3 middle-sized Canadian cities. Subjects completed questionnaires assessing basic knowledge, attitudes toward computers, and information that teachers would like to have regarding computers. The findings indicated that preschool teachers support the use of computers in the ECE environment, but require information that is reliable, systematic, and informed. Findings were used to provide suggestions about the content of training workshops for early childhood educators. (Includes questionnaire used for the study. (KB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 435 481

Computer Training For Early Childhood Educators

Jacqueline Specht
Huron College

Eileen Wood
Wilfrid Laurier University

Teena Willoughby
Brock University

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
Jacqueline Specht
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Presented at the annual meeting of the American Educational Research Association. April 19-23 1999. Montreal, Canada. Session 25.30

This research was supported through a grant to the authors by the Social Sciences and Humanities Research Council of Canada.

Correspondence concerning this paper should be addressed to Jacqueline Specht, Psychology Department, Huron College, 1349 Western Road, London, Ontario, N6G 1H3, Canada. Electronic mail may be sent to jspecht@julian.uwo.ca

BS 020067

BEST COPY AVAILABLE

Computer Training For Early Childhood Educators

Jacqueline Specht, Eileen Wood, & Teena Willoughby

ABSTRACT

Recent research in early childhood education centres suggests that some teacher characteristics are not at a level that would support computer learning opportunities for the children. The purpose of the present study was to determine what areas of support teachers require in order to provide a smooth introduction of the computer into the ECE classroom. Questionnaires assessing basic knowledge, attitudes towards computers, and information that teachers would like to have regarding computers were completed by 196 (192 female and 4 male) early childhood educators from 3 mid-size cities in Canada. Results indicated that teachers support the use of computers in the ECE environment, but require information that is reliable, systematic and informed. Ideas for a computer workshop for early childhood educators are provided along with suggestions for future research in the area of computer use in the ECE classroom.

What Early Childhood Educators Want to Know About Computers

Similar to many learning contexts, children seem to have a natural curiosity and enthusiasm for computers (Obrist, 1983). Because computers can be used to facilitate learning, it is important that educators know how to use this enthusiasm and curiosity about computers to guide young children's learning. Haugland (1995) suggests that four factors are essential for computers to have a significant impact in the early childhood education environment. Three of Haugland's four factors involve the early childhood educator. Specifically, teachers must be open to technology and receptive to the placement of the computers in the classroom. They must also be aware of the potential benefits of computers and that computers can play a positive role in the classroom. To achieve this awareness, they must be trained in early childhood computer integration. Finally, computers must be available in the early childhood setting.

Recent research in early childhood education centres suggests that some teacher characteristics and the environment are not at a level that would support computer learning opportunities. For example, in a survey of early childhood centres in 3 cities, Wood, Willoughby, and Specht (1998) found that over half of the centres surveyed did not have a computer on the premises. Of those that did, use was limited because of concerns among the staff about knowledge and familiarity regarding computers and computer software. In fact, 100% of the participants voiced concern about having sufficient knowledge about or experience with computers to use them effectively.

Knowledge of and familiarity with computers is a necessary first step for promoting computer use. Rosen & Weil (1995) suggest that a lack of knowledge

about computers may lead to anxiety about computers. They found that over half of the respondents that were surveyed were technophobic and that the best predictor of anxiety regarding computers was past experience with, and knowledge about computers. They concluded that in order to prevent this technophobia, children need to be taught by teachers who are informed, confident and comfortable with the computer technology. Similarly, Weil, Rosen, and Wugalter (1990) found that if the initial introduction of the computer was made by someone who was confident and positive about technology, less feelings of anxiety developed among the learners. In addition, Payne (1983) reports that providing teachers with hands-on experience alleviates some of the anxiety. Providing educators with computer training seems a necessary first step in implementing computers in the classroom.

Although some research has examined the needs of elementary school educators (e.g., Payne, 1983; Rosen & Weil, 1995), with respect to computer knowledge, no one has identified the unique needs of early childhood educators. Piotrowski (1992) explains that it is important to ensure that training addresses the unique needs of those participating in the training, rather than following some broad itinerary. It is for this reason that the present study surveyed early childhood educators in order to determine exactly what knowledge they have and what they are lacking. Our goal is to use the information gained to allow us to develop a framework for instruction of early childhood educators. Providing information based on a framework drawn for early childhood educators should help them to feel more confident about computer technology and implementing computers in the early childhood classroom.

Method

Participants

Directors for 130 early childhood education centres were mailed a survey package. This number represented every early childhood education centre (day care, preschool, nursery, etc.) listed in the phone book for 3 mid-sized Canadian cities (excluding those that had requested not to participate in Wood et al., (1998). Each package contained surveys to be completed by the staff members at the centres. Of the 130 centres contacted, 52 participated. Twenty-one packages were returned because the centre was no longer in business, and 57 of the centres did not want to participate. Response rate of viable centres was 48%. The total number of participants from the centres was 196 (192 Females, 4 males). The average age of the participants was 29 years (SD = 9.58) and they averaged 5.69 years (SD = 5.3) of experience. The average age of the children in the classroom was 3.5 years (SD = 1.55).

Materials and Procedure

One package was mailed to the director of each centre. The package contained enough copies of the survey for each ECE staff member at the centre, consent forms for each survey and two prepaid envelopes (one for returned surveys and one for return of consent forms). In addition one letter of introduction, addressed to the director, explained the content of the survey, procedures for returning completed materials and a request for the director to recruit staff to complete the survey. All surveys were completed anonymously with the name of the centre as the only feature identifying the source of the survey. The survey contained 20 questions. The first set of questions dealt with existing knowledge of computers. Specifically, these questions determined tasks

that the ECE staff would require assistance to execute. They also assessed the programs and functions that were familiar, and the source of their current computer knowledge. The second set of questions was designed to determine staff members personal feelings about computers and their attitudes toward implementation in ECE centres. Finally, the survey asked what they would be interested in learning and provided an opportunity for teachers to share concerns about implementing computers in the classroom that had not been addressed in the survey (see Appendix A for a copy of the survey). Approximately one month after the surveys were mailed, follow-up phone calls were made to all directors for whom surveys had not been returned. If directors requested it, another survey package was sent.

Results and Discussion

Given Haugland's (1995) tenet that computers can be effective in early childhood classrooms only when teachers see a need for them, it was important to assess the teachers' opinions. On a scale of 1 (strongly disagree) to 5 (strongly agree), teachers overwhelmingly support the use of computers in the ECE environment (M=4.4, SD=.81), and think that preschool children can benefit from using computers (M=4.6, SD=.67). This enthusiastic support of the technology in the ECE environment suggests that computers would be adapted easily in the ECE setting. However, based on Wood et al. (1998), we suspect that the positive attitudes toward computer technology may be tempered by ECE teachers' computer literacy skills. To assess whether skills may limit the teachers' ability to use computers efficiently, we assessed their computer knowledge.

When asked to identify their general familiarity with the computer

components and how to operate these components, the ECE teachers demonstrated some familiarity with the general components of a computer, but little familiarity with hardware or with their ability to problem solve about computer concerns. Specifically, using a scale of 1 (none at all) to 5 (a great deal), knowledge for general components of computer (monitor, mouse, keyboard) had a mean around the midpoint of the scale (M=2.83, SD=1.01) as did general knowledge of operating systems (M=2.3, SD=1.03), with knowledge for computer applications being slightly lower (M=2.15, SD=1.18). In comparison, low ratings were assigned for knowledge of computer hardware (M=1.95, SD=.86) and the related ability of hardware specifications when shopping for a computer (e.g., memory, hard drive, size of screen) (M=2.08, SD=1.11), with the ability to problem solve when the computer is not working (M=1.86, SD=.94) receiving the lowest rating.

We also asked the respondents to identify tasks with which they would require assistance. Again, for items related to general/standard components of the computer, the educators did not need assistance. That is, turning on a computer (94%), using a mouse (93%), inserting a disk (89%), and inserting a CD-ROM (75%). The key areas of concern seem to be setting up a computer to recognize the printer (64% require assistance), setting the mouse for speed and sensitivity (71% require assistance), and installing software (77% require assistance).

Because we had asked about their knowledge of operating systems and software applications, we asked them to identify the programs with which they were familiar. Given the finding of Haugland and Shade (1994) that the Apple computer was the most common system, we expected a high level of familiarity with the Mac Operating System. In fact, very few were familiar with a Mac

Operating System (3.1%). Obviously there is a difference between the American and Canadian (Haugland & Shade vs. the present study) populations or there has been a shift in preferred operating systems since the Haugland and Shade (1994) study. This difference makes the point that we must know the needs of our participants. Windows95 seemed to be the most familiar operating system (69%). Computer games were the software programs with which they were most familiar (77%) and the more complex uses of the computer (e.g, draw programs, spreadsheets, presentations) were familiar to less than 30%.

After determining their level of knowledge and assessing the specific programs/systems with which the teachers were familiar, we asked them to identify the source of their knowledge of computers. Trial and error rated as the highest (62%), followed by family members (56%), co-workers (38%), workshops (19%), books (13%), retail staff (7%) and TV shows (2%).

In summary, with respect to specific knowledge about computers, we can conclude that early childhood educators have some basic knowledge of the basic components of a computer and how to operate the computer. In terms of the more complex elements, however, they are lacking information. It also is important to note that even their knowledge of the basics of the computer leaves considerable room for improvement. It is critical to note the source of their knowledge. The information that they do have seems to come from trial and error. Although trial and error may be effective sometimes, it is neither efficient nor systematic. It is clear that these teachers at present do not have a source of information that is reliable, systematic, and informed.

A typical observation in the computer literacy literature is that individuals who perceive themselves to be low in knowledge about computers tend to

experience more anxiety when engaging in computer-related tasks (e.g., Rosen & Weil, 1995). Our sample also indicated some anxiety about computer use. For example, about half of our sample (49%) agreed that computers made them nervous and 74% agreed at some level that while working on computers, they worry that they may do something wrong (push the wrong buttons, insert the wrong commands) that will foul up the computer program. Even with these concerns, however, 95% agreed that they would like to increase their knowledge and skills on the computer. In addition, many participants, on the open-ended question, reiterated their concerns with low knowledge and even indicated that a workshop would be beneficial. The other big concern was the obtainment of financial resources to purchase computers for the classroom.

Overall, this survey points to the specific areas of weakness about computers among ECE teachers. It also is clear that even though teachers perceive a need for more information and have some anxiety about using computers, they are very enthusiastic about introducing and implementing this technology in their centres. What these survey findings do provide is an outline for creating a template in order to provide this population with the knowledge and experience required to become more comfortable using computers and more computer literate. In particular, we believe that their information would be suited to a workshop presentation.

From the findings, we can provide a few general suggestions about the content of the workshops. Because knowledge was generally low, the workshop for early childhood educators should spend some time orienting them to the components of the computer and explaining how to use an operating system. It may be argued that the operating system does not need to be trained because 69%

stated that they were familiar with Windows95. However, 71% of respondents stated that they would require assistance in changing the speed of the mouse. It is clear that they do not understand the complexities of Windows95. The speed of the mouse is especially relevant given that young children could have differences in dexterity, hence knowledge of features that could accommodate different needs would be beneficial. By showing educators some of the general tasks of the operating system, they will be able to tailor the computer for all of their students.

As the main objective of a workshop would be to help educators feel comfortable using computers in the classroom in order to reduce their anxiety, time needs to be spent with hands-on experience learning how to manage all aspects of the computer from hardware to software. This would include a review of specific instruction about the components that make up a computer. Given restricted financial budgets mentioned by most of our centres, it is important for teachers to know enough about computer hardware and operations to select the right unit for their centres needs, and to be able to manage the simple problems in order to avoid wasted opportunities and expenses when external supports are required. Specifics of a useful workshop would include learning how to install, run, and evaluate educational software for the children.

Because software is changing constantly, it is important to train teachers to choose developmentally appropriate software. Haugland and Shade's (1988) 10 criteria of age appropriateness, child control, clear instructions, expanding complexity, independent exploration, process orientation, real world representation, technical features, trial and error, and visible transformations provide a good framework for testing software. To make these criteria clear, it

would be helpful to demonstrate software that is developmentally appropriate and software that is developmentally inappropriate to allow the teachers the comparison. Finally, because there is considerable anxiety and this is evident both in our study and in previous work (Payne, 1983; Weil et al., 1990), it would be important to ensure that the environment of the workshop be supportive and active to ensure practice and mastery of these basic skills.

An issue of importance that has not been addressed by the present study surrounds the pedagogy of computers in the early childhood classroom. This question is beyond the scope of the present paper, but is one that should be addressed. We feel that in order for teachers to be able to discuss the use of computers in the early childhood classroom, they need to be familiar with the spectrum of uses that the computer could have (e.g., electronic babysitter, drill and practice, and problem-solving). Given the findings of the current study, it is clear that they first need to be trained in the basic skills of computer use. They can then bring the computers into the classroom and then determine the pedagogical use. Future research should investigate how teachers view the computer in the classroom, but only after it is certain that they have the experience on which to base their decision.

In summary, in order to bring young minds into the next millennium, it is important first to train the skills of the educators.

References

Haugland, S. (1995). Will technology change early childhood education? Day Care and Early Childhood Education, 22, 45-46.

Haugland, S. & Shade, D. (1988). Developmentally appropriate software for young children. Young Children, 43, 37-43.

Haugland, S., & Shade, D. (1994). Early childhood computer software. Journal of Computing in Childhood Education, 5, 83-92.

Obrist, A.J. (1983). The microcomputer and the primary school. London: Hodder and Stoughter.

Payne, J.S. (1983). An in-service workshop that helps teachers reduce computer anxiety. (ERIC Document Reproduction Service No. ED 238 240).

Piotrowski, S.M. (1992). Computer training: Pathway from extinction. (ERIC Document Reproduction Service No. ED 348 955).

Rosen, L.D., & Weil, M.M. (1995). Computer availability, computer experience and technophobia among public school teachers. Computers in Human Behavior, 11, 9-31.

Weil, M.M., Rosen, L.D., & Wugalter, S. (1990). The etiology of computerphobia. Computers in Human Behavior, 6, 361-379.

Wood, E. Willoughby, T. & Specht, J. (1998). What's happening with computer technology in early childhood education settings? Journal of Educational Computing Research, 18, 237-243.

COMPUTER SURVEY FOR ECE STAFF

We are asking all the staff members from your daycare to complete this survey. Please do not sign your name, as we would like to ensure anonymity. We will be using the combined data from all of our participants to design a computer skills workshop for ECE staff that best fits your needs.

Gender: Male _____ Female _____ Age: _____

Name of Your Centre: _____

How long have you worked at the Centre: _____

What is the average age of the children for which you are primarily responsible? _____

In the next section, we would like to ask you a series of questions about computers and computer use. Please indicate which response best captures your personal experience.

The first set of questions deals with your existing knowledge about computer. Please circle the most appropriate number:

1. How much knowledge do you feel you have about the components that make up your computer (monitor, mouse, keyboard, etc)?

1	2	3	4	5
none at all	some	a moderate amount	quite a bit	a great deal

2. If you were shopping for a computer, would you be comfortable identifying the specifications you would need for : a) memory, b) hard drive, c) size of screen, d) type of machine (IBM, Mac, etc.)

1	2	3	4	5
not at all	somewhat	moderately	very	completely

3 How much knowledge do you feel you have about computer operating systems (e.g, Windows 3.1, Windows 95, DOS, Mac Operating System)?

1	2	3	4	5
none at all	some	a moderate amount	quite a bit	a great deal

4. How much knowledge do you feel you have about computer hardware (e.g., memory, hard drive, size of screen, etc.).

1	2	3	4	5
none at all	some	a moderate amount	quite a bit	a great deal

5. How much knowledge do you have about computer application programs (e.g., word processing, spreadsheet, presentations, etc)?

1	2	3	4	5
none at all	some	a moderate amount	quite a bit	a great deal

6. How comfortable do you feel about problem solving when your computer is not working?

1	2	3	4	5
none at all	some	a moderate amount	quite a bit	a great deal

7. For each of the items below, circle those for which you would require assistance:

a connecting your computer components (e.g., monitor, keyboard)
b turning on the computer
c inserting a disc
d inserting a CD-ROM
e using a mouse
f setting the computer to recognize your printer
g setting the mouse for speed/sensitivity
h installing software

---

8. For which of the following programs have you had any personal experience of exposure (circle):

a DOS
b Windows 95
c Windows 3.1
d Mac Operating System
e draw program
f spreadsheets
g word processing
h web/Netscape
i e-mail
j computer games
k presentations
l educational software

---

9. With which programs are you familiar?

Name of Program	Function (e.g. game, word processing, etc.)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

BEST COPY AVAILABLE

10. How did you gain your computer knowledge? (please circle as many as apply)

a books
b TV shows
c trial and error
d retail staff____
e co-workers
f family members
g workshops

other: please explain _____

_____

Please rate the following statements on the 5-point scale provided below. Circle the number that best represents your opinion.

1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree

11.	While working on the computer, I worry that I may do something wrong (push the wrong buttons, insert the wrong commands) that will foul up the computer program.	1 2 3 4 5
12.	Computers make me nervous.	1 2 3 4 5
13.	I like experimenting with new computer software.	1 2 3 4 5
14.	I like experimenting with new computer hardware	1 2 3 4 5
15.	I would like to increase my knowledge/skills on the computer.	1 2 3 4 5
16.	I feel computers have a role in the ECE classroom.	1 2 3 4 5
17.	I feel that preschool children can benefit from learning to use computers.	1 2 3 4 5
18.	I would be interested in learning about how other people have allocated computer time among the children in our centre.	1 2 3 4 5
19.	I would be interested in learning about educational research concerning the use, benefits, and effectiveness of computers and software in early childhood education.	1 2 3 4 5

BEST COPY AVAILABLE

20. Do you have any concerns about implementing the computer in the classroom? If so, what are they?

Any other questions or comments?

Thank you for taking the time to complete this questionnaire.